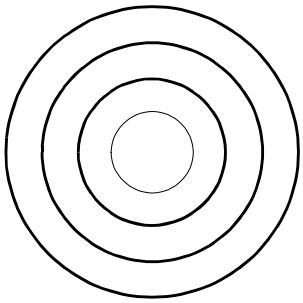
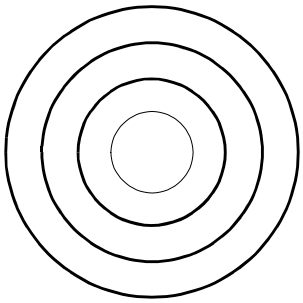
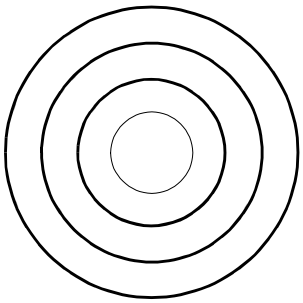
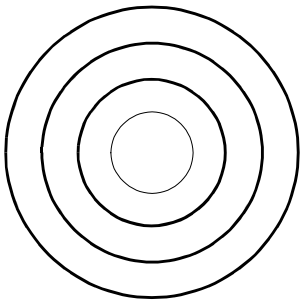
Name:_____

Chemistry Unit Test – SNC 2D

1. Complete each Bohr diagram. Include all details:

S 	Al 
O^{2-} 	Ar 

2. Give a definition for the octet rule:

3. Write the ion that forms as a result of the octet rule for each of the following atoms (first one is done for you):

$_{11}Na$	Na^{1+}
$_{33}As$	
$_{20}Ca$	
$_{19}K$	
$_{17}Cl$	

$_{16}S$	
$_{13}Al$	
$_{53}I$	
$_{1}H$	
$_{15}P$	

$_{6}C$	
$_{49}In$	
$_{10}Ne$	
$_{14}Si$	
$_{8}O$	

4. Provide either names or formula for each of the following:

calcium chloride		KCl	
calcium chlorate		K_2SO_4	
sodium sulphide		Au_2SO_4	
sodium sulphate		AgCl	
nickel(II) nitride		HgCl	
iron(III) carbonate		$ZnCl_2$	
manganese(VII) iodide		$Sr(NO_3)_2$	
lead(II) nitrate		V_2O_5	

5. For each of the following descriptions, provide the evidence of a chemical change:

   a) two solutions are mixed together, there is the formation of a bright red compound that makes the mixed solution cloudy and no longer see through

   b) a spark is provided to ignite the gas of a Bunsen burner to produce a flame

   c) after shaking a can of pop, opening the can results in an abrupt overflow of fizz

   d) when the indicator bromothymol blue is place in acid, it turns from blue to yellow, slowly adding base will turn the colour back to blue (will pass through a green phase on the way to blue)

6. What type of change is the melting an ice cube to form water? Explain the reason for your choice.

7. What type of change is creating carbon dioxide and water from the combustion of methane. Explain the reason for your choice.

8. For each of the following reactions, provide chemical coefficients to balance each equation and state the type of equation:

synthesis:	A + B → AB
decomposition:	AB → A + B
single replacement:	A + BC → AC + B
(hint – find elements)	D + BC → BD + C
double replacement:	AB + CD → AD + CB
combustion of a hydrocarbon:	C_xH_y + O_2 → CO_2 + H_2O

BALANCE!!!	REACTION TYPE
$KClO_3$ → KCl + O_2	
P_4O_{10} + H_2O → H_3PO_4	
C_3H_8 + O_2 → CO_2 + H_2O	
$Fe_2(SO_4)_3$ + KOH → K_2SO_4 + $Fe(OH)_3$	
Al + FeO → Al_2O_3 + Fe	
Al + O_2 → Al_2O_3	
$Al_2(SO_4)_3$ + $Ca(OH)_2$ → $Al(OH)_3$ + $CaSO_4$	
Al + HCl → $AlCl_3$ + H_2	

9. Fill out this table to give a comparison between the properties of an acid and a base:

ACIDS	BASES

10. What are the common products of a neutralization reaction? Give an example using both a word equation and a chemical equation for hydrochloric acid (HCl) and sodium hydroxide (NaOH)

word equation:
chemical equation:

11. Please look at the following information regarding pH indicators:

INDICATOR NAME	pH COLOUR RANGE													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
methyl orange	red				orange									
litmus	pink						blue							
bromothymol blue	yellow							blue						
phenolphthalein	clear								pink					
alizarin yellow	yellow									pink				

Come up with a pH range for each substance based on the following information:

a) vinegar – turn litmus to pink
– methyl orange to red

b) washing soda – turns litmus to blue
– alizarin yellow to pink

c) baking soda – turns bromothymol to blue
– phenolphthalein to clear

d) calcium hydroxide – turns phenolphthalein to pink
– alizarin yellow to yellow

12. Draw a pH scale from 1 to 14. Label the portion that is acidic, basic and neutral. On this scale place the following items
    a) sulphuric acid (a very strong acid used in batteries)
    b) sodium hydroxide (lye, a very strong base used to make soap pioneer days)
    c) baking soda
    d) lemon juice
    e) good face soap

    You may wish to draw your scale vertically.

13. For each of the following gases, indicate if the gas is combustible, supports combustion or extinguishes combustions. Also indicate how you could test this gas with either a glowing splint or a flaming splint. One example is done for you:

GAS	COMBUSTION PROPERTIES	SPLINT TEST
Xenon (Xe)	extinguishes combustion	flaming splint goes out
Hydrogen (H_2)		
Oxygen (O_2)		
Carbon Dioxide (CO_2)		
Acetylene (C_2H_2)		